

ATTACHMENT 1
to FCC Public Notice DA 12-1565

**Preliminary views presented at
1 October 2012 Meeting of
the Advisory Committee for
the 2015 World Radiocommunication Conference**

Maritime Aeronautical and Radar Services

UNITED STATES OF AMERICA

DRAFT PRELIMINARY VIEWS FOR WRC-15

Proposed Edits to NTIA Preliminary View on WRC-15 AI 1.13 (ref. WAC/006(01.10.12))

Agenda Item 1.13: to review No. **5.268** with a view to examining the possibility for increasing the 5 km distance limitation and allowing space research service (space-to-space) use for proximity operations by space vehicles communicating with an orbiting manned space vehicle, in accordance with Resolution **652 (WRC 12)**

BACKGROUND: WARC-92 allocated the band 410-420 MHz to the space research service (SRS) on a secondary basis to allow for extra-vehicular activity (EVA) communications in the immediate vicinity of low earth orbit (LEO) manned space vehicles. EVA refers to manned activities outside a spacecraft (e.g., spacewalk). No. **651A (WARC-92)** limited the use of the band by the SRS to EVA operation within 5 kilometers (km) of orbiting manned space vehicles. WRC-97 upgraded the allocation to the SRS in the band 410-420 MHz to primary status and No. **5.268** specified a set of power flux-density (pfd) limits to ensure protection of the fixed and mobile services while retaining the 5 km distance limitation for EVA operation.

Resolution **652 (WRC-12)**, *recognizing c*, states that “power flux-density (pfd) limits contained in No. **5.268** ensure the protection of terrestrial stations operating in the fixed and mobile services independent of the distance from, or the source of, space-to-space communications in the SRS.” ITU-R preliminary analyses using a spread spectrum signal in the 410-420 MHz band by a LEO vehicle suggest that these vehicle links can meet the pfd limits in No. **5.268** for distances beyond 5 km. Long-term space exploration objectives require new activities around a manned space station other than EVA, such as visiting vehicles for crew transportation/cargo re-supply and free-fly proximity vehicles for inspection and maintenance. These vehicles need to initiate communication over distances greater than 5 km to ensure proper vehicle positioning, data exchange and system monitoring. Therefore, it is necessary to modify No. **5.268** to remove the 5 km distance restriction and EVA limitation while maintaining the pfd limits.

U.S. VIEW: The United States supports the removal of both the 5 km distance limitation and restriction to EVA operation, if the studies performed in accordance with Resolution **652 (WRC-12)**, demonstrate space vehicle links operating around a manned vehicle beyond 5 km can meet the pfd limits in No. **5.268**. Removal of these two restrictions will allow for greater flexibility in using the band 410-420 MHz for space research activities while maintaining protection of the terrestrial services.

UNITED STATES OF AMERICA

DRAFT PRELIMINARY VIEWS FOR WRC-15

Proposed Edits to NTIA Preliminary View on WRC-15 AI 1.17 (ref. WAC/008(01.10.12))

Agenda Item 1.17: to consider possible spectrum requirements and regulatory actions, including appropriate aeronautical allocations, to support wireless avionics intra-communications (WAIC), in accordance with Resolution **423 (WRC-12)**

BACKGROUND: The aerospace industry is developing the future generation of commercial aircraft to provide airlines and the flying public more cost-efficient, safe, and reliable aircraft. Wireless capabilities will reduce aircraft weight, provide multiple and redundant methods to transmit safety-related information, and provide environmental benefits and cost savings to manufacturers and operators.

WAIC systems consist of multiple radiocommunication devices between two or more transmitters and receivers on a single aircraft and provide safety-related aircraft applications. WAIC system transmissions are located both inside and outside the aircraft with the majority being not limited to the interior of the aircraft structure. ~~For example, wireless sensors mounted on the wings or engines can communicate with systems located within the aircraft.~~ WAIC communication traffic will be between transmitters and receivers on the same aircraft as part of a closed, exclusive network required for aircraft operation. WAIC systems will not provide air-to-ground, air-to-air or air-to-satellite communications.

Report ITU-R M. 2197 provides findings on the technical characteristics and operational requirements of WAIC systems.

Although Resolution **423 (WRC-12)** does not provide a specific frequency range in the “*Resolves*” section, the “*Invites ITU-R*” section, point (3), indicates studies should consider:

- i. frequency bands within existing worldwide aeronautical mobile service, aeronautical mobile (R) service and aeronautical radionavigation service allocations; and
- ii. additional frequency bands above 15.7 GHz for aeronautical services if spectrum requirements cannot be met in frequency bands studied under *invites ITU-R 3 i)*

U.S. VIEW: The United States supports regulatory actions, including appropriate allocations to the AM(R)S limited to WAIC systems, if the results of ITU-R studies show compatibility with existing services in accordance with Resolution **423 (WRC-12)**. Those studies should consider frequency bands above 15.7 GHz only if spectrum requirements cannot be met in existing worldwide AMS, AM(R)S and/or ARNS allocations below 15.7 GHz.

UNITED STATES OF AMERICA

DRAFT PRELIMINARY VIEWS FOR WRC-15

Proposed Edits to NTIA Preliminary View on WRC-15 AI 1.18 (ref. WAC/008(01.10.12))

Agenda Item 1.18: to consider a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz frequency band in accordance with Resolution **654 (WRC-12)**

BACKGROUND: Resolution **654 (WRC-12)** calls for WRC-15 to consider a primary allocation to the radiolocation service in the 77.5-78 GHz frequency band for automotive applications, based on appropriate technical, operational and regulatory studies, including sharing studies with services operating in the band and compatibility studies in nearby bands. The resolution also calls for evaluation of Intelligent Transportation System (ITS) safety-related applications that would benefit from global or regional harmonization.

The worldwide automotive industry is developing vehicular radar systems that would operate on an unlicensed basis in portions of the 76-81 GHz band for safety and operational purposes. Such systems may contribute substantially to road safety, diminishing the increasing incidence of traffic fatalities and injuries due to driver distraction. Similar systems operate around 24 GHz.

The primary amateur and amateur-satellite allocation in the 77.5-78 GHz band was relocated from 75.5-76 GHz by action of WRC-03. The band is shared with the secondary radio astronomy and space research (space-to-Earth) services. Additionally, radio astronomy observatories worldwide, including the Atacama Large Millimeter Array, built through an international collaboration, observe in the 76-81 GHz band. No. **5.149** states that, in this band, “administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference.” The ITU-R studies will need to consider sharing and compatibility with these services.

U.S. VIEW: The United States supports ITU-R sharing, compatibility and regulatory studies between vehicular radars and all services that operate in the 76-81 GHz region of the spectrum. Based on the outcome of those studies, the United States will consider supporting an allocation to the radiolocation service in the 77.5-78 GHz band for automotive radars.

Terrestrial Services

UNITED STATES OF AMERICA

DRAFT PRELIMINARY VIEWS FOR WRC-15

Agenda Item 1.1: to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution **233 (WRC-12)**

BACKGROUND: The 2012 World Radiocommunication Conference (WRC-12) recognized a need for additional radio spectrum to support the increasing mobile data traffic, and placed consideration of additional spectrum allocations for terrestrial mobile broadband applications on the agenda for WRC-15.

Preliminary studies now underway in the ITU show that there are several frequency ranges, including some portions of the spectrum between around 1000 and 2000 MHz, that have propagation characteristics and other physical properties that, without consideration of interservice compatibility and sharing issues, may make spectrum in those ranges suitable for the provision of terrestrial mobile broadband service.

Joint Task Group 4-5-6-7 was established at the first session of the Conference Preparatory Meeting for WRC-15 (CPM15-1) in February 2012 to consider spectrum requirements for IMT/mobile broadband and the requirements and results of studies from any concerned ITU-R Working Parties on technical and operational characteristics, spectrum requirements and performance objectives or protection requirements of other services.

One of the existing services in the 1000-2000 MHz frequency range is the radionavigation-satellite service (“RNSS”), which has allocations used for space-to-Earth and space-to-space RNSS systems in the 1164-1215 MHz, 1215-1300 MHz, and 1559-1610 MHz band. Several global non-geostationary orbit RNSS systems – including the Global Positioning System (GPS), the Russian GLONASS system, and the European Galileo system, and a number of geostationary-orbit satellites that provide space-based augmentation services – have operated in these bands with multiple generations of satellites. RNSS receivers and applications are deployed by the tens of millions worldwide, and are pervasive in every facet of everyday life. RNSS receivers are used in the Global Navigation Satellite System (GNSS) and other safety-of-life applications; precision surveying, construction, agriculture, and mining; environmental monitoring (including earthquake and tsunami monitoring); timing applications throughout the wireless industry; and so on. RNSS shares its allocations at 1559-1610 MHz and 1164-1215 MHz with the aeronautical radionavigation service (ARNS), also a safety service.

Multiple RNSS systems and networks transmit signals around-the-clock across all three RNSS allocations in the 1000-2000 MHz frequency range and radiate across the entire surface of the

Earth; RNSS frequency bands thus are fully operational at all times in all locations on Earth. RNSS signals are very low-power, spread-spectrum signals coming from space that are difficult to detect. It takes special processing by RNSS receivers to extract the weak signals from the background noise. If a high-power signal in an RNSS band or in a nearby/adjacent band is broadcast near an RNSS receiver, it could desensitize the RNSS receiver to the degree that the RNSS receiver is unable to extract the RNSS signal from space. Some RNSS receivers have wide bandwidths and are designed to use the entire RNSS allocation.

During the 1997-2000 ITU-R study cycle, after taking into account studies and a number of factors (including the many critical timing, positioning, and navigation uses of RNSS), CPM-99 concluded, in Section 2.2.1.3 of the CPM Report for WRC-2000, that “[s]haring of the 1559-1610 MHz band – including any portion of the segment at 1559-1567 MHz – with any co-frequency communication service is not recommended.” WRC-2000 agreed, and declined to add a co-primary MSS allocation to a portion of the RNSS band. Just this year, WRC-12 modified Resolution 417 to include strict power limits on high-powered terrestrial transmitters in the aeronautical radionavigation service band at 960-1164 MHz to protect RNSS in the 1164-1215 MHz band. There is a long history of protecting RNSS operations in the ITU.

U.S. VIEW: The United States supports studies in the ITU-R under Agenda Item 1.1, and believes that there will be the opportunity for WRC-15 to make new co-primary allocation to the mobile service in some bands that will help to alleviate the mobile broadband spectrum shortfall. As important as finding new mobile broadband spectrum may be, it is essential that no action be taken under WRC-15 Agenda Item 1.1 that could cause harmful interference to or otherwise have a negative impact on the millions of users in Region 2 and worldwide who rely in their lives and businesses on the continued availability of RNSS signals in the 1164-1215 MHz, 1215-1300 MHz, and 1559-1610 MHz bands.

UNITED STATES OF AMERICA

DRAFT PRELIMINARY VIEWS FOR WRC-15

Agenda Item 1.1: to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution **233 (WRC-12)**

BACKGROUND: Mobile broadband systems, data and applications have become key drivers of global economic growth, job creation and competitiveness. A recently released industry report indicates that global mobile data traffic grew 133 percent in 2011 alone, with mobile video comprising 52% of the traffic.¹ This dramatic increase in demand for mobile broadband applications has led to a need for additional radio spectrum to support the increasing mobile data traffic. The World Radiocommunication Conference 2012 (WRC-12) recognized this need and adopted WRC-15 Agenda Item 1.1, in an effort to address a looming spectrum shortage for mobile broadband services.

It is particularly advantageous to consider the 470-698 MHz frequency range to help ameliorate the potential mobile broadband spectrum shortfall in Region 2. There are a number of factors that make the 470-698 MHz band particularly attractive for mobile broadband applications:

- The lower and upper edges of the 470-698 MHz frequency range are adjacent to bands that are already identified for IMT (e.g., 450-470 MHz (No. **5.286AA**) and 698-902 MHz (No. **5.317A**)) in Region 2. This will aid in providing for commonality of equipment while reducing its cost and complexity.
- The 470-698 MHz frequency range has better propagation characteristics compared to higher frequency bands and can provide significant coverage in rural areas. This is particularly important for the developing countries and countries with large areas of low population density.
- Most importantly, a new, international allocation to the Mobile service that is co-primary with existing services would afford administrations the flexibility to maximize spectrum efficiency consistent with their national priorities.

Currently, in Region 2, the 470-698 MHz range is allocated predominantly to the Broadcasting service with the 608-614 MHz band allocated to Radio Astronomy. It is important to note, however, that:

- the 470-512 MHz frequency band is allocated to the mobile service on a primary basis in Argentina, Canada, Chile, Colombia, Cuba, Ecuador, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru (No. **5.293**);

¹ Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2011-2016.

- the 512-608 MHz frequency band is allocated to the mobile service on a primary basis in Canada, Costa Rica, Cuba, El Salvador, the United States, Guatemala, Guyana, Honduras, Jamaica and Mexico (No. **5.297**);
- the 614-698 MHz frequency band is allocated to the mobile service is on a primary basis in Canada, Chile, Colombia, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru the (No. **5.293**).

It is also worth noting that in Region 2, the primary allocation to the mobile service extends from 698 MHz to 902 MHz as well as from 928 MHz to 960 MHz, while in Region 3 there is a primary mobile allocation from 450-960 MHz.

U.S. VIEW: The United States considers that a new co-primary allocation to the mobile service in the 470-698 MHz frequency range would help to alleviate the mobile broadband spectrum shortfall. This new co-primary allocation would provide administrations with the necessary flexibility to implement future transitions to digital television and manage any frequency rearrangements resulting from the digital dividend consistent with their national priorities. Recognizing that international regulations pertain only to cross-border sharing while each administration has a sovereign right to regulate the use of frequencies within its territory, the United States supports no change to the existing broadcasting and radio astronomy allocations in the 470-698 MHz frequency range.

UNITED STATES OF AMERICA

DRAFT PRELIMINARY VIEWS FOR WRC-15

AGENDA ITEM 1.2: to examine the results of ITU-R studies, in accordance with Resolution **232 (WRC-12)**, on the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and take the appropriate measures

BACKGROUND: The decision by World Radiocommunication Conference 2012 (WRC-12) to allocate the frequency band 694-790 MHz to the mobile service in Region 1, subject to the provisions of Resolution 232 (via Footnote 5.3xx), led to the adoption of Agenda Item 1.2 for WRC-15 to examine the results of ITU-R studies, in accordance with Resolution 232 and take the appropriate regulatory actions. *Resolves* 2 through 5 of Resolution 232 pertain to the details of the regulatory actions that must be addressed by WRC-15: they are likely to have limited impact to administrations outside of Region 1 (and also those who are not signatories to the GE06 agreement). However, the studies called for under *invites ITU-R* 1 through 4 of Resolution 232 could lead to the development of sharing and compatibility methodologies that may subsequently be suggested for application to possible sharing and compatibility studies undertaken in the UHF band for WRC-15 Agenda Item 1.1.

The main concern is to ensure that the results of the studies undertaken by administrations regarding the 694-790 MHz band in Regions 1:

- (1) do not lead to regulatory constraints that may adversely impact the interests of countries in Region 2 in the 470-698 MHz or 698-790 MHz frequency ranges;
- (2) do not establish any precedence for Agenda Item 1.1 studies concerning Region 2, especially regarding the aspects of spectrum requirements or compatibility studies.

According to the Terms of Reference for the Joint Task Group (JTG) 4-5-6-7, the results of its studies can be submitted to the relevant ITU-R Study Groups and these Study Groups can approve ITU-R Recommendations and/or Reports developed by the JTG 4-5-6-7, as appropriate. Since the JTG 4-5-6-7 is the responsible group for both WRC-15 Agenda Items 1.1 and 1.2, it is possible that some Administrations might exert pressure to utilize the same sharing and compatibility methodologies for the studies to be undertaken in support of both agenda items within the JTG.

U.S. VIEW: The United States is of the view that the studies undertaken by JTG 4-5-6-7 to address WRC-15 Agenda Items 1.1 and 1.2 are separate and distinct, even if bands of interest to both agenda items prove to be similar. Therefore, sharing and compatibility methodologies that may be utilized in possible sharing and compatibility studies undertaken for WRC-15 Agenda Item 1.2 will not *a priori* be agreed for application to studies under WRC-15 Agenda Item 1.1. Furthermore, the United States is of the view that there is no basis for any change to the Radio Regulations being addressed under WRC-15 Agenda Item 1.2 that pertain to, or otherwise impact, Region 2.

UNITED STATES OF AMERICA

DRAFT PRELIMINARY VIEWS FOR WRC-15

Agenda Item 1.3: to review and revise Resolution **646 (Rev.WRC-12)** for broadband public protection and disaster relief (PPDR), in accordance with Resolution **648 (WRC-12)**

BACKGROUND: ITU-R Resolution 646 (WRC-03) was developed out of an effort by some administrations to harmonize spectrum for PPDR. As adopted at WRC-03, this Resolution only covers harmonization of spectrum for PPDR on a Regional basis, and it contains a fairly large number of bands. Under this Agenda item, the Resolution could be revised to address the increasing demand for broadband PPDR applications. Some believe that the scope of those revisions could include adding or deleting bands from the Resolution to address the future spectrum needs for broadband PPDR.

The U.S. position, dating from WRC-03, has been to oppose global harmonization of PPDR spectrum due to concerns of harmful interference across other services/systems.

U.S. VIEW: The United States did not have a proposal for an Agenda Item on PPDR and did not support the CITEL IAP on the topic.

The U.S. recognizes that some aspects of Res. 646 may be considered out-of-date including recommended frequency bands for PPDR applications (particularly in Region 3), and that current and future demand for broadband PPDR (especially video) has much evolved since the time of WRC-03. The U.S. supports revision of the text of Resolution 646 to address these changes (e.g. *considerings f-j, recognizing g-h*).

The revisions proposed to the Resolution could include revisions of the list of bands, in addition to revisions to the text. The U.S. view is that detailed assessment of the potential for harmful interference to existing services must be conducted if spectrum bands are added or if spectrum bands currently used on a regional basis are identified on a global basis.

UNITED STATES OF AMERICA

DRAFT PRELIMINARY VIEWS FOR WRC-15

Agenda Item 1.4: to consider possible new allocation to the amateur service on a secondary basis within the band 5 250-5 450 kHz in accordance with Resolution **649 (WRC-12)**

BACKGROUND: The amateur service continues to grow, with more than three million licensed operators worldwide, 706,000 of them in the United States. Radio amateurs utilize their allocations to engage in scientific investigation and experimentation, provide communication in the wake of natural disasters, provide non-commercial public service communications, and conduct other activities to advance technical education, develop radio operating technique, and enhance international goodwill.

The radio amateur's ability to accomplish these goals depends on access to frequency bands throughout the radio spectrum, particularly in the HF range. In order to maintain effective and reliable communications capability and throughout the sunspot cycle, the maximum desirable interval between HF frequency bands in a radio service is 1.4 to 1. At present, the interval between the 3.5 and 7 MHz bands varies from 1.84 to 1 in ITU Region 1 to 1.75 to 1 in ITU Region 2.

Incumbent services in the 5 250-5 450 kHz range include the fixed, mobile, and radiolocation services. Experience has shown that amateur service operation is incompatible with HF radiolocation, so the 5 250-5 275 kHz range is not suitable to satisfy this agenda item. The amateur service has a longstanding secondary allocation at 10 100-10 150 kHz, with no reported unsolvable interference to primary fixed service operation. Some administrations, including the United States, have permitted amateur service licensees privileges within the 5 275-5 450 kHz range under Radio Regulations No. 4.4, in some cases permitting operation on discrete channels, and in others access to a frequency band. Again, no cases of unresolvable interference are known.

U.S. VIEW: The United States is of the view that a contiguous secondary allocation of at least 150 kHz within the frequency range 5 275-5 450 kHz should be made to the amateur service, and that listen-before-transmit protocols are sufficient to protect the primary fixed and mobile services.

Space Services

UNITED STATES
PRELIMINARY VIEWS ON WRC-15

WRC-15 Agenda Item 1.5: to consider the use of frequency bands allocated to the fixed-satellite service not subject to Appendices **30**, **30A** and **30B** for the control and non-payload communications of unmanned aircraft systems (UAS) in non-segregated airspaces, in accordance with Resolution **153 (WRC-12)**;

ISSUE: The referenced WRC-15 agenda item provides the basis for developing technical, regulatory and operational recommendations to WRC-15 addressing the use of satellites in the fixed-satellite service (“FSS”) to provide for the control and non-payload communications (“CNPC”) of UAS in non-segregated airspace.

BACKGROUND: From a technical standpoint, aircraft radio links can be relayed via commercial satellites using an FSS allocation. Many commercial aircraft are already equipped with commercial FSS systems at Ku and Ka-band.

These existing commercial FSS systems operating between 10 and 31 GHz offer immediate access to spectrum for UAS. Specifically, various segments within 10.95 – 14.5 GHz and within 17.30 – 31.0 GHz are suitable for UAS CNPC. This is advantageous in that; (a) there are no satellite systems currently operating in the 5030-5091 MHz band to support current/near-term UAS CNPC, and (b) even when such a system becomes commercially available, it is likely that additional spectrum will be required in order to meet availability requirements. FSS operators have expressed concern about adding new service allocations within the FSS bands, such as AMS(R)S, due to the potential for interruption to existing and future customers implementing other types of FSS applications.

In order to ensure safe operation of UAS, it is expected that technical Standards and Recommended Practices (“SARPs”) for CNPC will be developed in ICAO, and that those SARPs would be independent of the specific link used to provide CNPC. The operation of UAS CNPC in FSS can then be designed to operate within the established FSS interference environment while meeting those SARPs. In such an approach, UAS CPNC would be operating as an FSS application, with the responsibilities and liabilities of the FSS and UAS operator specified in a commercial contract.

Studies by the ITU-R (Report ITU-R M.2233) show that, from a technical standpoint, commercial FSS satellite networks in the indicated bands can support UAS control links and meet the desired link availability. Regulatory measures may be appropriate to address the mobile nature of UAS with CNPC in the FSS.

U.S. VIEW: The United States supports the benefits offered from allowing UAS Control and Non-payload Communication links to operate using FSS satellites and supports studies and development of the necessary technical and regulatory provisions required for such operation.

DRAFT PRELIMINARY VIEW
2015 WORLD RADIOCOMMUNICATION CONFERENCE

PRELIMINARY VIEWS ON WRC-15
Agenda Item 1.7

AGENDA ITEM 1.7: *to review the use of the band 5 091-5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-geostationary mobile-satellite systems in the mobile-satellite service) in accordance with Resolution 114 (Rev.WRC-12)*

ISSUE: This agenda item invites the ITU-R to conduct appropriate studies to review the use of the band 5091-5150 MHz by feeder links (Earth-to-space) of non-geostationary mobile-satellite systems with respect to the aeronautical radionavigation service in accordance with Resolution 114 (WRC-12).

BACKGROUND: At WRC-95, a Primary allocation, subject to **5.444A**, was made to the fixed-satellite service in the 5091-5150 MHz band for feeder links to non-GSO mobile-satellite service systems, in the Earth-to-space direction.

The 5091-5150 MHz band was originally designated for expansion of the international standard Microwave Landing System (MLS) and Recommendation ITU-R S.1342 describes a method for determining coordination distances between international standard MLS stations operating in the band 5030-5090 MHz and FSS stations providing Earth-to-space feeder links in the 5091-5150 MHz band.

At WRC-07, an additional allocation subject to **5.444B** was made, in the 5091-5150 MHz band, to the aeronautical mobile service (AMS) for use by surface applications at airports, aeronautical telemetry transmissions from aircraft stations and aeronautical security transmissions. The latter application was suppressed by WRC-12. Compatibility between the newly allocated aeronautical mobile service planned usage and the existing fixed-satellite service usage was demonstrated by extensive studies carried out by the ITU-R in the lead up to WRC-07.

The fixed-satellite service allocation at 5091-5150 MHz is currently used by the HIBLEO-4FL and HIBLEO-X systems and has been used compatibly with other services since 1998. The extensive studies undertaken in preparation for WRC-07 resulted in the creation of **No. 5.444B** and Resolutions **748(WRC-07)**, **418(WRC-07)** and **419(WRC-07)** and demonstrated compatibility between the fixed-satellite service and each of the aeronautical mobile (route) service applications.

The operator of the HIBLEO-4FL and HIBLEO-X systems is nearing the completion of the replenishment of its satellite constellation with the expected completion in 2013. As these new spacecraft will be replacements for existing equipment, they will also utilize the 5091-5150 MHz range for feeder links in the Earth-to-space direction. The replacement satellites are expected to remain in service beyond the year 2025.

As a result of these developments, continued FSS use of the 5091-5150 MHz band for feeder links of the MSS, Earth-to-space, is required. Taking into account the time constraints contained in **5.444A**, it is necessary to comply with Resolution **114 (WRC-03)** prior to 2018. Recognizing the considerable effort expended in studying the compatibility between the Earth-to-space feeder links of the MSS systems and the Aeronautical Mobile Service in preparation for WRC-07, and since the interference budgets and scenarios studied before remain the same for the HIBLEO-4FL and HIBLEO-X replacement spacecraft, study of technical and operational issues can and should be limited to the sharing of this band between new systems of the aeronautical radionavigation service (ARNS) and the FSS providing feeder links of the non-GSO systems in the MSS.

The continued use of this allocation by feeder uplinks is of great importance in providing ongoing service by MSS systems to developing countries, under-served areas and critical response in the event of natural disasters and other civil emergencies.

U.S. VIEW: A permanent Primary allocation to the fixed-satellite service for use by feeder links (Earth-to-space) of non-geostationary MSS systems in the 5091-5150 MHz band may be feasible if ITU-R studies show conclusively that the operation of these feeder links are compatible with the operation of ARNS systems in the 5091-5150 MHz band.

DRAFT PRELIMINARY VIEW
2015 WORLD RADIOCOMMUNICATION CONFERENCE

PRELIMINARY VIEWS ON WRC-15
Agenda Item 1.8

AGENDA ITEM 1.8: *to review the provisions relating to earth stations located on board vessels (ESVs), based on studies conducted in accordance with Resolution 909 (WRC-12);*

ISSUE: possible revision of the limitations and restrictions contained in Resolution 902 (WRC-03) in light of the ESV technologies being currently deployed.

BACKGROUND: Agenda item 1.8 considers the need to review and possibly revise limitations and restrictions contained in Resolution 902 (WRC-03) in light of the current ESV technologies being currently deployed (e.g. use of spread spectrum modulation), while ensuring the continued protection of other services to which the frequency bands 5 925-6 425 MHz and 14.0-14.5 GHz are allocated.

In the United States, the 5925-6425 MHz frequency band is allocated on a primary basis to the Fixed Satellite Service (Earth-to-Space) and the Fixed Service. This band may also be used for Earth-to-Space communication of earth stations on board vessels. Similarly the 14.0-14.5 GHz frequency band is allocated on a primary basis to the Fixed Satellite Service (Earth-to-Space). This band may be used for Earth-to-Space communication of earth stations on board vessels and of Vehicle Mounted Earth Stations. Parts of this band are also allocated on a secondary basis to the Mobile Satellite Service (Earth-to-Space) and to the Space Research Service.

This issue was considered during the 2007-2012 ITU-R study cycle. It was noted in the course of these studies that, the assumptions used in Recommendations ITU-R S.1587-2 (“Technical characteristics of earth stations on board vessels communicating with FSS satellites in the frequency bands 5 925-6 425 MHz and 14-14.5 GHz which are allocated to the fixed-satellite service”) and ITU-R SF.1650-1 (“The minimum distance from the baseline beyond which in-motion earth stations located on board vessels would not cause unacceptable interference to the terrestrial service in the bands 5 925-6 425 MHz and 14-14.5 GHz”), which were the basis for Resolution 902 (WRC-07), are no longer representative of current ESV technologies. For example, typical ESVs operate today with e.i.r.p. density levels that are more than 20 dB lower than those used in Recommendation ITU-R SF.1650-1. As a consequence, ESV operations are unduly restricted by constraints derived on the basis of ESV systems with much higher interference potential.

As Recommendation ITU-R SF.1650-1 was largely the basis for the ESV restrictions contained in Annex 2 of Resolution 902 (WRC-03), the earlier observations regarding unduly restrictive constraints equally apply to this Resolution.

Consistent with resolves 1 of Resolution 909 (WRC-12), studies are currently underway to investigate the use of an alternative approach, including use of a pfd criterion, that could allow more flexibility to ESV operation while protecting co-frequency terrestrial services. Within the ITU-R, the topic has already been addressed in input contributions to ITU-R meetings.

U.S. VIEW: The United States supports the continuation of studies of possible alternative approaches, including the use of a pfd criterion, as a means to allow more flexibility to ESV operation while continuing to protect co-frequency services. .

UNITED STATES OF AMERICA

DRAFT PRELIMINARY VIEWS FOR WRC-15

Agenda Item 1.6.1 to consider possible additional primary allocations to the fixed-satellite service (Earth-to-space and space-to-Earth) of 250 MHz in the range between 10 GHz and 17 GHz in Region 1 and review the regulatory provisions on the current allocations to the fixed-satellite service within this range, taking into account the results of ITU-R studies, in accordance with Resolution **151 (WRC-12)**.

ISSUE: To address a shortage and imbalance in ITU Region 1 and to harmonize with spectrum allocations to the fixed-satellite service in Regions 2 and 3 in the indicated spectrum range.

BACKGROUND: The existing unplanned FSS bands are extensively used for a myriad of applications. The very small aperture terminal (VSAT) services, video distribution, broadband networks, internet services, satellite news gathering, and backhaul links have triggered the rapid rise in the demand. Satellite traffic is typically symmetrical in a large variety of applications, i.e. similar amounts of Earth-to-space (uplink) and space-to-Earth (downlink) traffic are transmitted.

WRC-12 adopted two new resolutions (Resolutions **151 (WRC-12)** and **152 (WRC-12)**) to study, as a matter of urgency, possible primary allocations for unplanned FSS to address this asymmetry in Regions 2 and 3 as well as look for additional Earth-to-space and space-to-Earth allocations for the unplanned FSS in Region 1. These are reflected in Agenda items 1.6.1, and 1.6.2, respectively. This Preliminary View concerns agenda item 1.6.1.

It should be noted that a world-wide allocation for the FSS has a significant advantage over a regional one. For example, the same and/or equal FSS allocations for Regions 1, 2 and 3 is typical and important in terms of planning, construction, and orbit management of satellite networks, as well as achieving effective coverage area.

Also, in terms of improving spectral efficiency and convenience of communications set up (system architecture), it is desirable that any additional spectrum for FSS be allocated in a part of the spectrum that is contiguous to the existing fixed-satellite service allocations.

In Region 1, while there are equal allocations between uplink and downlink spectrum, there is a difference of 250 and 300 MHz of unplanned FSS spectrum when compared with Regions 2 and 3.

In order to facilitate efficient use of spectrum for satellite services and address this shortage in the uplink and downlink of FSS spectrum in Region 1 when compared with the FSS allocations in other Regions, **Agenda Item 1.6.1** is to consider additional primary allocations to the fixed-satellite service (FSS) in the range 10-17 GHz in Region 1 (Earth-to-space and space-to-Earth)

and a review of regulatory provisions for existing FSS allocations, taking into account ITU-R studies in accordance with Resolution **151 (WRC-12)**.

Resolution **151 (WRC-12)** invites the ITU-R to complete, for WRC-15, sharing and compatibility studies towards additional primary allocations to the fixed-satellite service of 250 MHz in both directions in Region 1 within the bands 10-17 GHz, focusing on the frequency range that is contiguous (or near contiguous) to the existing fixed-satellite service allocations, while protecting existing primary services within these bands. This Resolution also calls for studies considering utilization of existing allocations to the FSS in both directions through a review of regulatory provisions, except for Nos. **5.502** and **5.503** and Resolution **144 (Rev. WRC-07)**.

Working Party 4A has under development a Preliminary Draft New Report **ITU-R S.[R1.FSS]** on an Assessment on use of spectrum in the 10-17 GHz band for the fixed-satellite service in Region 1 (GSO) which establishes and documents the issues and difficulties associated with this shortfall and provides a framework for further work on the associated analyses in support of this agenda item.

U.S. VIEW: The United States supports sharing studies in support of actions by WRC-15 to add new primary fixed-satellite service allocations of up to 250 MHz in both directions in Region 1 within the bands 10-17 GHz, focusing on spectrum that is contiguous (or near contiguous) to the existing non-planned fixed-satellite service allocations, taking into account the sharing and compatibility studies with existing services in accordance with Resolution **151 (WRC-12)**. The United States also supports consideration by WRC-15 a revision of regulatory provisions that would allow for greater flexibility in utilizing existing allocations to the fixed-satellite service in both directions, taking into account the sharing and compatibility studies with existing services in the 10-17 GHz band in accordance with Resolution **151 (WRC-12)**.

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DRAFT PRELIMINARY VIEWS FOR WRC-15

Agenda Item 1.6.2 to consider possible additional primary allocations to the fixed-satellite service (FSS) (Earth-to-space) of 250 MHz in Region 2 and 300 MHz in Region 3 within the range 13-17 GHz and review the regulatory provisions on the current allocations to the fixed-satellite service within this range, taking into account the results of ITU-R studies, in accordance with Resolution **152 (WRC-12)**.

ISSUE: To address the imbalance in the amount of uplink and downlink spectrum allocated to the fixed-satellite service in Regions 2 and 3.

BACKGROUND: The existing unplanned FSS bands in this frequency range are extensively used for a myriad of applications. The very small aperture terminal (VSAT) services, video distribution, broadband networks, internet services, satellite news gathering, and backhaul links have triggered the rapid rise in the demand. Satellite traffic is typically symmetrical in a large variety of applications, i.e. similar amounts of Earth-to-space (uplink) and space-to-Earth (downlink) traffic are transmitted. However, in ITU Regions 2 and 3, there are asymmetrical Earth-to-space and space-to-Earth FSS allocations that are used for these services.

The 250 MHz spectrum asymmetry in Region 2 and 300 MHz in Region 3 translates to approximately 10 and 14 transponders for each respective Region, considering a transponder bandwidth of 36 MHz in both polarizations. Some satellite networks are designed with an additional uplink beam which has sufficient geographical isolation with the uplink beam within the intended service area, to compensate for the lack of spectrum. However, this does not solve the need for additional uplink spectrum over the intended service area, and leads to difficulties in using all of the available downlink spectrum over that area. The impact of this uplink frequency shortfall is further exacerbated due to other operational constraints and restrictions found within the Radio Regulations.

The satellites currently deployed have been registered in all of the available non-planned bands in Regions 2 and 3, both in the uplink and the downlink. Faced with the current congestion and spectrum asymmetry, it is difficult for satellite operators to effectively expand their communication services within this frequency range to meet the growing market demands.

In order to address this spectrum shortage and imbalance, WRC-12 adopted Agenda item 1.6.2 to consider additional primary allocations to the fixed-satellite service in the range 13-17 GHz and review regulatory provisions for existing FSS allocations, taking into account ITU-R studies in accordance with Resolution **152 (WRC-12)**. Resolution **152 (WRC-12)** invites the ITU-R to

complete, for WRC-15, sharing and compatibility studies towards additional allocations to the fixed-satellite service in the Earth-to-space direction of 250 MHz in Region 2 and 300 MHz in Region 3 within the band 13-17 GHz, focusing on the frequency range that is contiguous (or near contiguous) to the existing fixed-satellite service allocations, while protecting existing primary services within these bands. This Resolution also calls for studies considering utilization of existing allocations to the FSS in the Earth-to-space direction through a review of regulatory provisions, except for Nos. **5.502** and **5.503** and Resolution **144 (Rev. WRC-07)**.

Within portions of the band 13-17 GHz are primary allocations to the fixed, mobile, radiolocation, Earth Exploration-Satellite (active), space research, and aeronautical radionavigation services. Moreover, consideration will be given to reducing constraints on use of the existing 14.5 – 14.8 GHz Fixed Satellite Service allocations, taking note of the limited planned use of the band in Region 3. In accordance with Resolution **152 (WRC-12)**, the ITU-R should conduct sharing studies to address the protection of existing in-band primary services and compatibility studies to address interference.

Working Party 4A already has under development a Preliminary Draft New Report **ITU-R S.[R2R3.FSS]** on an Assessment on use of spectrum in the 13-17 GHz band for the fixed-satellite service in Regions 2 and 3 (GSO), which establishes the issues and difficulties associated with this shortfall and provides a framework for further work on the associated analyses and sharing studies in support of this agenda item.

U.S. VIEW: The United States supports sharing studies in support of actions by WRC-15 to add new primary fixed-satellite service allocations in the Earth-to-space direction of 250 MHz in Region 2 and 300 MHz in Region 3 within the bands 13-17 GHz, taking into account the sharing and compatibility studies with existing services in accordance with Resolution **152 (WRC-12)**. The United States also supports consideration by WRC-15 of a revision of regulatory provisions in order to allow for greater flexibility in utilizing existing allocations to the fixed-satellite service in the Earth-to-space direction, taking into account the sharing and compatibility studies with existing services in the 13-17 GHz band in accordance with Resolution **152 (WRC-12)**.

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DRAFT PRELIMINARY VIEWS FOR WRC-15

Proposed Edits to NTIA Preliminary View on WRC-15 AI 1.10 (ref. WAC/006(01.10.12))

Agenda Item 1.10: to consider spectrum requirements and possible additional spectrum allocations for the mobile-satellite service in the Earth-to-space and space-to-Earth directions, including the satellite component for broadband applications, including International Mobile Telecommunications (IMT), within the frequency range from 22 GHz to 26 GHz, in accordance with Resolution **234 (WRC-12)**

BACKGROUND: WRC-12 adopted agenda item 1.10 in order to consider additional allocations to the mobile-satellite service (MSS) taking into account ITU-R studies in accordance with Resolution **234 (WRC-12)**. Resolution **234 (WRC-12)** invites the ITU-R to complete, for WRC-15, sharing and compatibility studies towards additional allocations to the mobile-satellite service in the Earth-to-space and space-to-Earth directions, within portions of the bands between 22 GHz and 26 GHz, while ensuring protection of existing services within these bands as well as taking into account No. **5.340** and No. **5.149**.

WARC-92 adopted numerous MSS allocations. However, WRC-97 and WRC-2000 made modifications to and suppressed some of these MSS allocations because sharing with other services was difficult or the conditions of use by MSS in some bands were impractical. WRC-12 considered possible new MSS allocations in the 4-16 GHz range under agenda item 1.25. ITU-R studies and WRC-12 determined that sharing with existing services by small mobile terminals in this range would require complex regulatory provisions ~~was not feasible~~ and therefore, no MSS allocations resulted. As a consequence, WRC-12 agreed to include agenda item 1.10 on the agenda for WRC-15, to consider possible MSS allocations in the 22-26 GHz range.

U.S. VIEW: The United States supports studies to determine if additional allocations for the MSS in the 22-26 GHz frequency range are possible. Before WRC-15 considers any potential allocation to the MSS, the study results must show that MSS is compatible with the incumbent services and does not place undue constraints on those services. Given the propagation characteristics in this frequency range, proponents of the new MSS allocations must provide MSS characteristics demonstrating that the intended services can operate in the 22-26 GHz band with sufficient reliability, and without adversely impacting the planned and current operations of services in the allocations in this frequency range.

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Proposed Edits to NTIA Preliminary View on WRC-15 AI 1.9.1 (ref. WAC/008(01.10.12))

Agenda Item 1.9.1: to consider possible new allocations to the fixed-satellite service in the frequency bands 7 150-7 250 MHz (space-to-Earth) and 8 400-8 500 MHz (Earth-to-space), subject to appropriate sharing conditions, in accordance with Resolution **758 (WRC-12)**

BACKGROUND: The frequency bands 7 250-7 750 MHz (space-to-Earth) and 7 900-8 400 MHz (Earth-to-space) are allocated worldwide to the fixed-satellite service (FSS). Some administrations report a shortfall of spectrum for their current and future FSS applications, and estimate an additional bandwidth requirement of up to 100 MHz for both uplink and downlink data transmission on FSS next-generation satellites.

The bands under study for the new FSS allocations are 7 150-7 250 MHz and 8 400-8 500 MHz. Both bands are currently allocated to the space research service (SRS), fixed service, and mobile service. The use of the bands 7 145-7 190 MHz and 8 400-8 450 MHz by the SRS is limited to deep space. The SRS supports near Earth missions in the bands 7 190-7 235 MHz and 8 450 -8 500 MHz. Currently, there are no other space services co-allocated with primary SRS (deep space) anywhere in the Radio Regulations.

In accordance with Resolution **758 (WRC-12)**, *resolves 2*, appropriate regulatory studies should be conducted to ensure that any new FSS allocation is~~will be~~ limited to FSS systems operated from a fixed known location and take into account that operational requirements in the bands 7150-7250 MHz (space-to-Earth) and 8400-8500 MHz (Earth-to-Space) do~~will~~ not encompass small VSAT-like FSS earth stations.

U.S. VIEW: If ITU-R studies demonstrate compatibility with incumbent services, the United States ~~will consider supporting~~ allocations to the FSS in the bands 7 150-7 250 MHz and 8 400-8 500 MHz, or portions thereof, limited to FSS systems operated from a fixed, known location, and taking into account that operational requirements in the bands 7150-7250 MHz (space-to-Earth) and 8400-8500 MHz (Earth-to-Space) do not encompassing small VSAT-like FSS earth stations.

UNITED STATES OF AMERICA

DRAFT PRELIMINARY VIEWS FOR WRC-15

Proposed Edits to NTIA Preliminary View on WRC-15 AI 1.12 (ref. WAC/006(01.10.12))

Agenda Item 1.12: to consider an extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz, in accordance with Resolution **651 (WRC-12)**

BACKGROUND: This agenda item seeks to extend the current Earth exploration-satellite service (EESS) (active) allocation in 9 300-9 900 MHz by an additional 600 MHz within portions of the range 8 700-10 500 MHz.

Incumbent services in the 9 900-10 500 MHz include the radiolocation, fixed, mobile, amateur, and amateur-satellite services. The radiolocation service is primary worldwide throughout the band. The fixed service is secondary worldwide from 9 900-10 000 MHz. The fixed and mobile services are primary in ITU Regions 1 and 3 from 10 000-10 450 MHz. The amateur service is secondary at 10 000-10 500 MHz worldwide, and the amateur-satellite service is secondary at 10 450-10 500 worldwide.

Currently, the 9 000-9 300 MHz band contains primary allocations to aeronautical and maritime radionavigation safety services. It is imperative to protect these safety service operations from harmful interference. Also, there is potential interference to ~~passive services stations (radio astronomy, EESS (passive) and space research service (SRS) (passive))~~ operating in the adjacent 10.6-5 -10.7 GHz band if the extension is made in the upper 9 900-10 500 MHz band, including stations in passive services (radio astronomy, earth exploration-satellite (passive), and space research (passive)). Similarly, there is potential interference to stations operating in the space research service in the band 8 400-8 500 MHz if the EESS allocation is extended to the lower 8 700-9 300 MHz band. In accordance with Resolution **651 (WRC-12)**, the ITU should conduct sharing studies to ensure the protection of existing in-band services and compatibility studies to address interference due to unwanted emissions into the ~~passive services in the 10 600-500 -10 700 MHz band~~ and the space research service in the 8 400-8 500 MHz band.

U.S. VIEW: If studies demonstrate that the existing in-band services and the adjacent band ~~passive services in the 10.6-5 -10.7 GHz band~~ are protected, the United States supports extending the EESS allocation by up to 600 MHz ~~utilizing the 9 900 MHz — 10.5 GHz band. Only if studies prove that existing services cannot be protected and/or sufficient spectrum cannot be made available in the 9 900 MHz — 10.5 GHz band does the United States support consideration of the 8 700 9 300 MHz band.~~

Regulatory Issues

UNITED STATES OF AMERICA

DRAFT PRELIMINARY VIEW FOR WRC-15

Agenda Item 9.1.2: Size of the coordination arc for triggering coordination under RR No. 9.7 between geostationary-satellite networks in the 30/20 GHz FSS bands¹

BACKGROUND:

The existing coordination arcs for geostationary-satellite orbit (GSO) networks in the 6/4 GHz, 14/10/11/12 GHz, and 30/20 GHz bands are based on Recommendation ITU-R S.1524. In these bands, the nominal longitudinal separations at GSO in most countries range from 2-4° in the 6/4 GHz band, and 2° in the 14/10/11/12 GHz and the 30/20 GHz bands. Thus, it is to be expected that the number of intervening networks would be higher at 6/4 GHz band than in the other two bands. Thus, RR Appendix 5 coordination arcs of +/- 10° and +/- 9° for the 6/4 GHz and 14/12/11/10 GHz bands were reduced slightly at WRC-12 to +/- 8° and +/- 7°, respectively. Resolution 756 (WRC-12) was adopted to study, among other things, whether additional reductions in the coordination arcs in RR Appendix 5 (Rev.WRC-12) are appropriate for the 6/4 GHz and 14/10/11/12 GHz frequency bands, and whether it is appropriate to reduce the coordination arc in the 30/20 GHz band.

ITU-R Working Party 4A has responsibility for this agenda item and has been developing information with respect to filings for FSS GSO networks in the 27.5-30.0 GHz/17.7-20.2 GHz allocations to which the relevant coordination arc would apply. While the data from the ITU-R website indicates an enhanced interest in the use of these allocations, and a number of networks has been registered in the MIFR, it appears from ITU “BIU” data that significantly fewer 30/20 GHz FSS networks have been brought into use.

U.S. VIEW:

It is the view of the United States to support continued studies on the necessity for reducing the coordination arc in the 27.5-30.0 GHz/17.7-20.2GHz FSS allocations. However, since in the 30/20 GHz bands there is a lower density of deployment and fewer coordination requests than in other FSS bands, it may not be necessary to reduce the

¹ This matter has been included in the Outline of the draft CPM Report to WRC-15 and is addressed in the Allocation of ITU-R preparatory work for WRC-15. *See* Administrative Circular (CA/201), Results of the first session of the Conference Preparatory Meeting for WRC-15 (CPM15-1), at Annexes 7 and 8.

coordination arc in the 30/20 GHz bands as was done at WRC-12 for the 6/4 and 14/10/11/12 GHz band FSS allocations.
